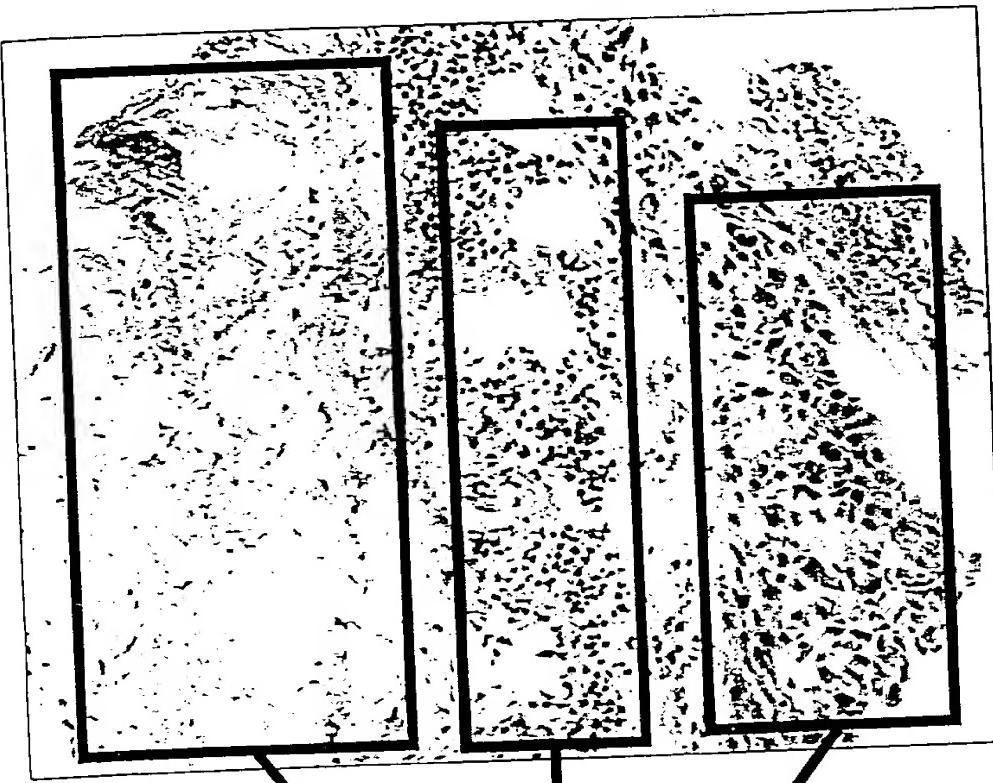


FIG. 1A

## Validation - phase I

- verification of initial ---
- screening results

- establish cellular -----
- localization & anatomic
- distribution



50-200  
series basic  
arrays

FIG. 1B

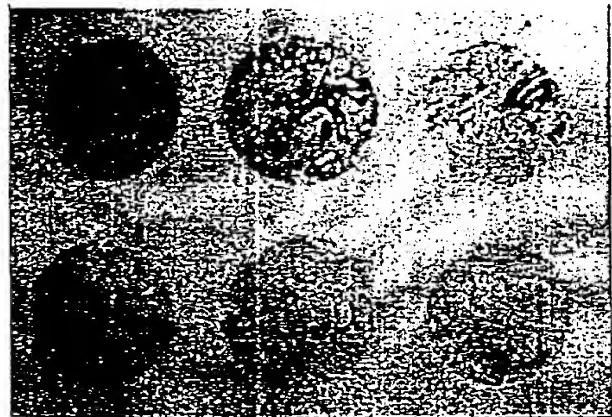


FIG. 2C

Stained with CK7 showing selective staining (400 $\times$ ). Diameters are 0.6 mm in diameter and spaced 0.3 mm apart.

**Ssample Data Sheet Information** (for one tissue element, located at A1a) provided with every PathWorks™ Tissue Microarray.

F16 2E

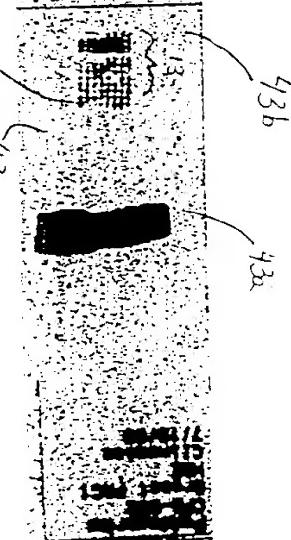
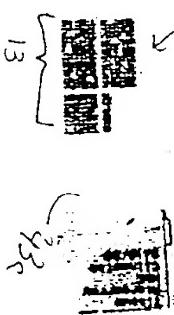


Fig. 2A

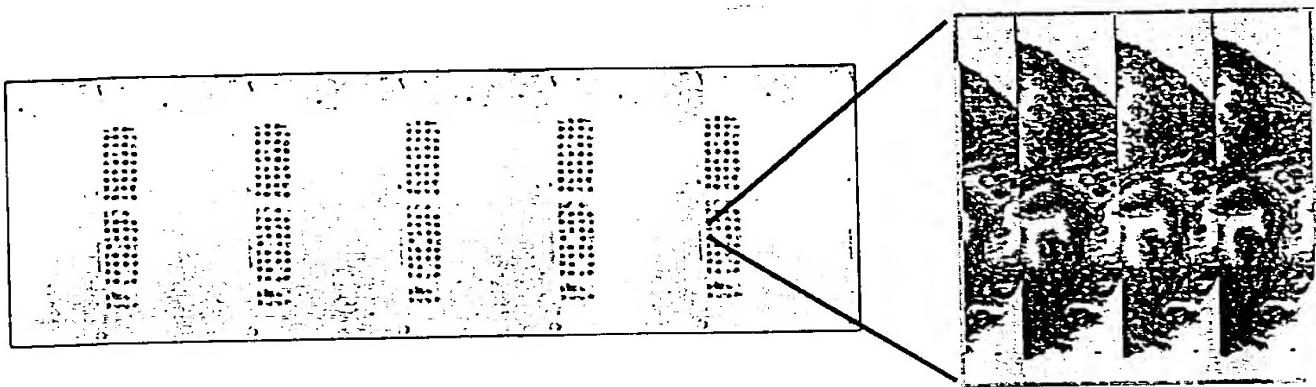


16. 28

B	00000000 00000000 00000000 00000000 00000000
A	00000000 00000000 00000000 00000000 00000000

1 2 3 4 5 6 7 8  
9 0 0 0 0 0 0 0

# Tissue MicroArrays



- Development of population databases
- High-throughput *in situ* analysis of DNA, RNA and protein
- Discovery of diagnostic and prognostic correlations
- Target prioritization

# The Clinomics Biorepository

**Clinomics Biorepository Application - [fmSpecimenEntry : Form]**

File Edit View Insert Format Records Tools Window Help

## Specimen Entry Form

Pathology #	Lookup	Pathology #	H-983-90																																										
Patient Data		Diagnosis																																											
Collection Date	Age at Collection	Received Date	Received Tech																																										
6/19/1990	83	10/15/1999	CD																																										
Medication		Con Medication	Specimen Type																																										
CMF		Methotrexate	Amount																																										
Chemotherapy		Lung	block																																										
Yes		Breast	Treatment																																										
Chemotherapy Date		Biopsy	TMMSpecie																																										
0/20/1990		Yes	Chemotherapy																																										
Primary Site		Radiation Therapy	Radiation Date																																										
Breast(l)		Radiotherapy	7/15/1990																																										
TubeType		Node Status	Positive																																										
Conical		Surgical Biopsy	Yes																																										
Surgeon		Save Record																																											
Yes		Add New Pathology																																											
		Delete Existing Pathology																																											
		Save Record																																											
<table border="1"> <thead> <tr> <th>ChromomicID</th> <th>Description</th> <th>Location</th> <th>SampleType</th> <th>Amount</th> <th>Quoted</th> </tr> </thead> <tbody> <tr> <td>0000002841</td> <td>Breast cancer</td> <td>TPA, A, tubes</td> <td>FFPE</td> <td>block</td> <td>0</td> </tr> <tr> <td>000007409</td> <td>Breast cancer</td> <td>TPA, A, tubes</td> <td>S</td> <td>100 mg/ml</td> <td>0</td> </tr> <tr> <td>000007491</td> <td>Breast cancer</td> <td>TPA, B, bags</td> <td>FFPE</td> <td>100 Mg</td> <td>0</td> </tr> <tr> <td>000007492</td> <td>Breast cancer</td> <td>TPA, B, bags</td> <td>FFPE</td> <td>100 mg</td> <td>0</td> </tr> <tr> <td>000007493</td> <td>Breast cancer</td> <td>TPA, A, tubes</td> <td>FFPE</td> <td>100 mg</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>TPCOC</td> <td></td> <td>11mm</td> <td>0</td> </tr> </tbody> </table>				ChromomicID	Description	Location	SampleType	Amount	Quoted	0000002841	Breast cancer	TPA, A, tubes	FFPE	block	0	000007409	Breast cancer	TPA, A, tubes	S	100 mg/ml	0	000007491	Breast cancer	TPA, B, bags	FFPE	100 Mg	0	000007492	Breast cancer	TPA, B, bags	FFPE	100 mg	0	000007493	Breast cancer	TPA, A, tubes	FFPE	100 mg	0			TPCOC		11mm	0
ChromomicID	Description	Location	SampleType	Amount	Quoted																																								
0000002841	Breast cancer	TPA, A, tubes	FFPE	block	0																																								
000007409	Breast cancer	TPA, A, tubes	S	100 mg/ml	0																																								
000007491	Breast cancer	TPA, B, bags	FFPE	100 Mg	0																																								
000007492	Breast cancer	TPA, B, bags	FFPE	100 mg	0																																								
000007493	Breast cancer	TPA, A, tubes	FFPE	100 mg	0																																								
		TPCOC		11mm	0																																								

FIG. 1A

# Biorepository Database

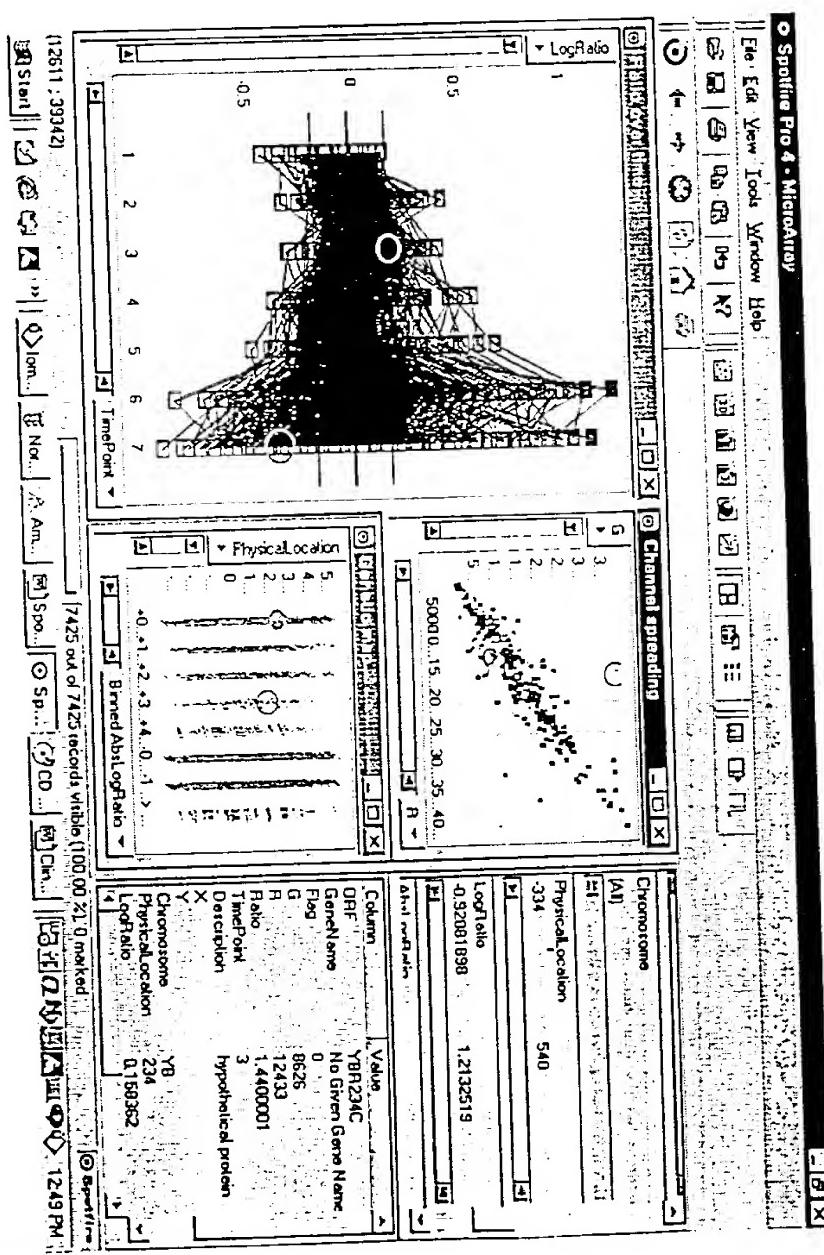
coordinates on array	histology	H&E grade	Tumor diameter	pT	pN	nodes examined	nodes pos	censor	months survival	age	homotherapy	chemotherapy	preopchemth
ducal									0	58	33		
ducal	invasive	1	90	3	1	40	28	0	78	48	no	yes	no
ducal		2	60	3	2	10	6	0	29	54	yes	no	no
ducal		1	20	1	0	8	0	0	96	55	no	no	no
ducal		1	30	4	1	9	2	0	64	70	yes	no	no
ducal		1	30	4	1	14	8	0	43	44	no	yes	no
ducal		1	10	1	1	11	2	0	12	51			
ducal		3	22	2	1	16	3	0	107	64	yes	no	no
ducal		3	30	2	3	4	4	0	21	48			
ducal		3	3	2				0	28	49			
ducal		2	40	2	1	13	5	0	55	60			
ducal		1	40	2	2	12	9	0	73	44			
ducal		2	30	4	2	10	7	0	85	70			
ducal		3	30	4	0	14	0	0	80	70	no	no	no

Medication and treatment histories, with outcomes, and expression profiles

FIG. 4B

# Biorepository Database

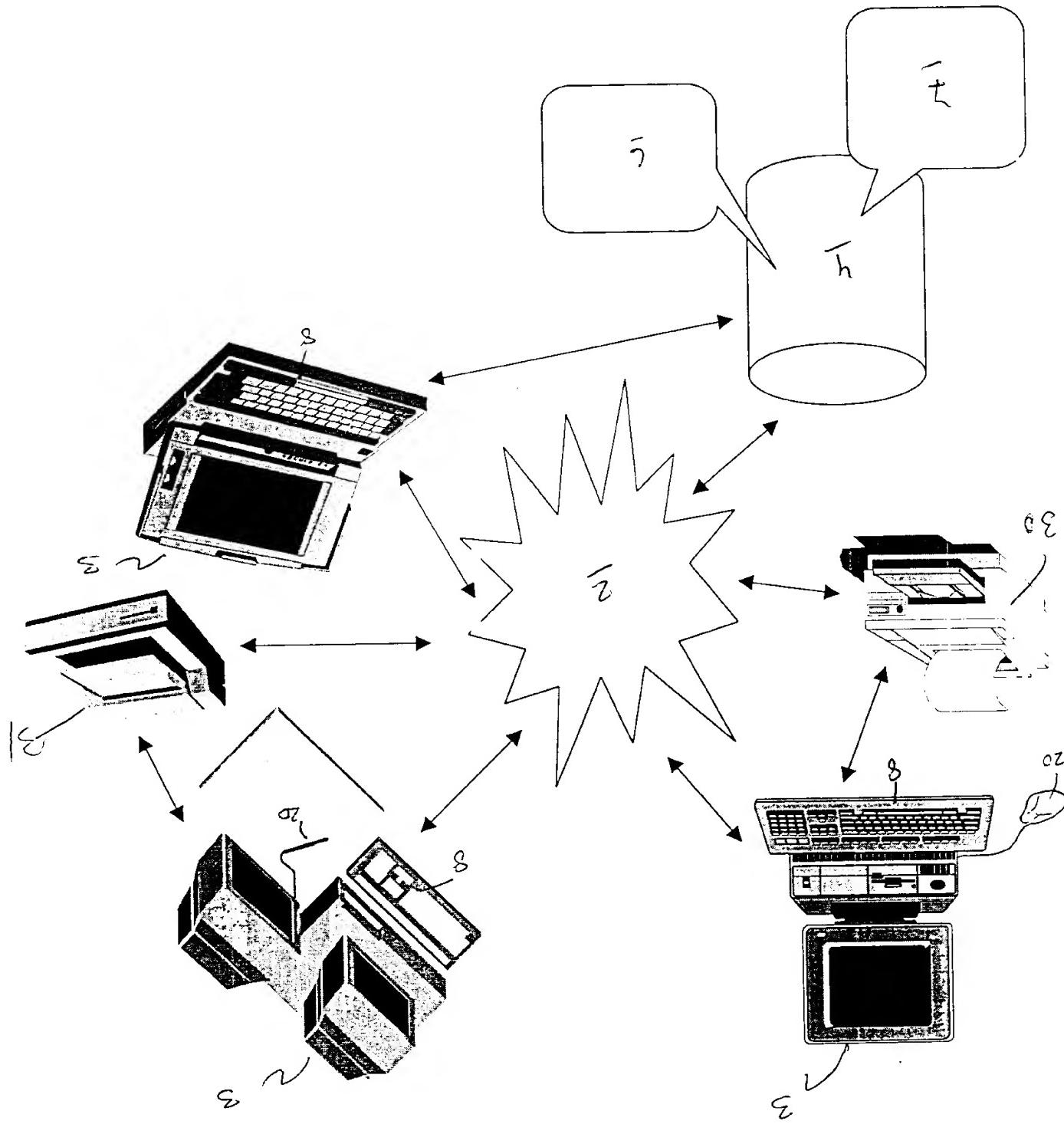
- Clustering analysis
  - Development of expression profiles vs. medical data
  - Sorting and selection of patient populations

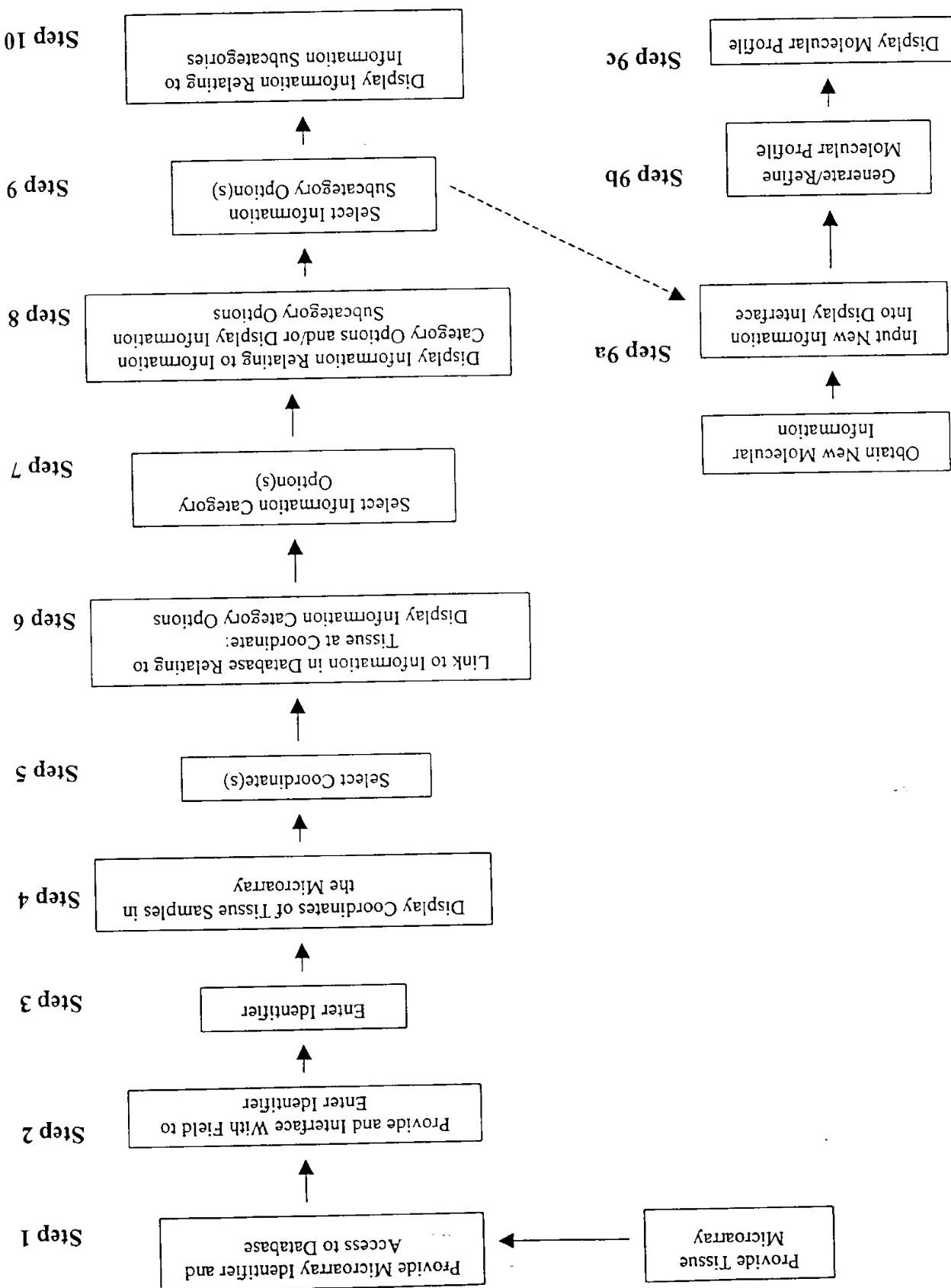


- ## Clustering analysis

FIG. 4C

FIGURE 5





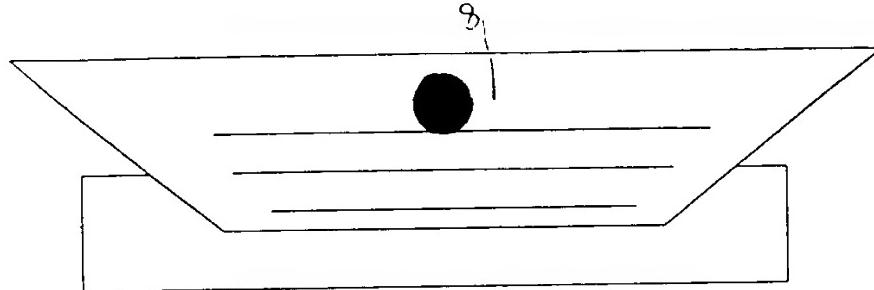


FIG. 7D

FIG. 7E

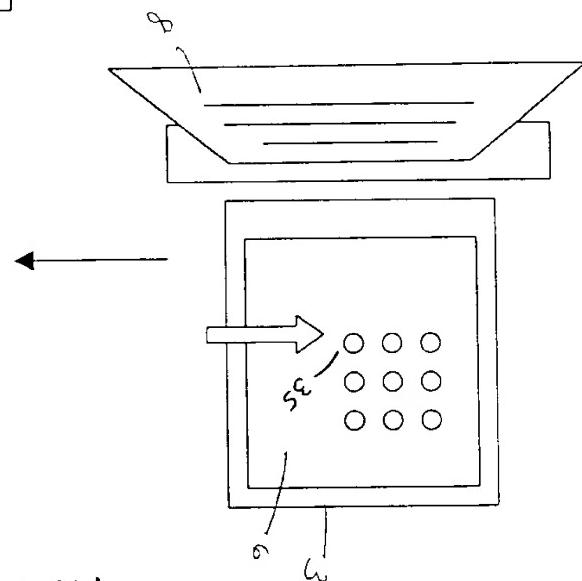
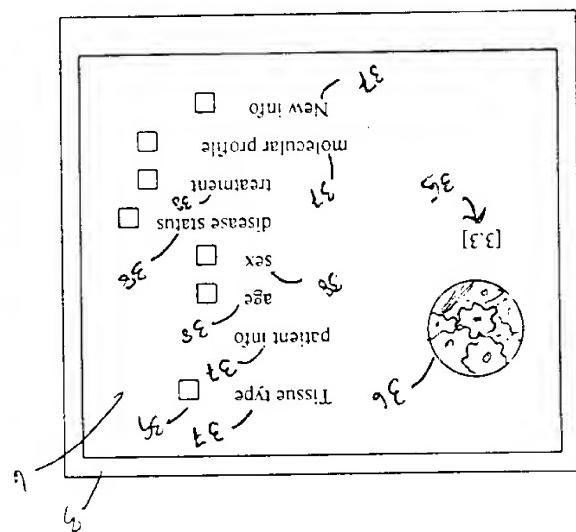


FIG. 7E

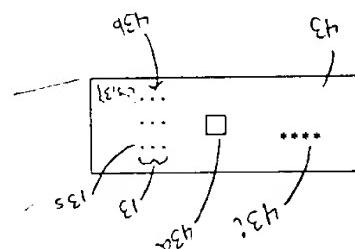
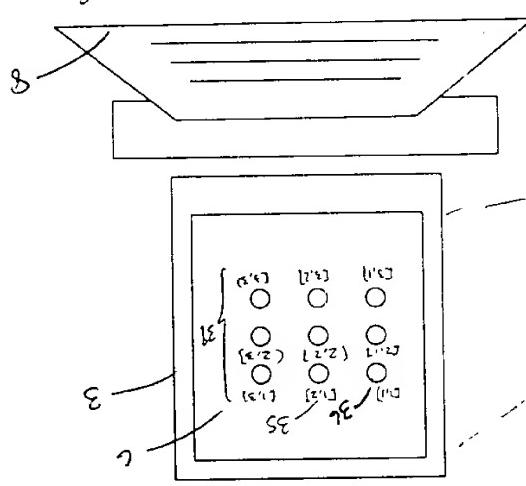


FIG. 7F

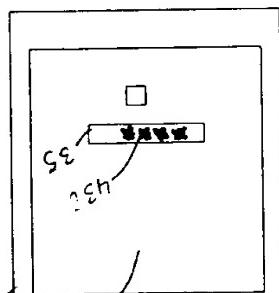
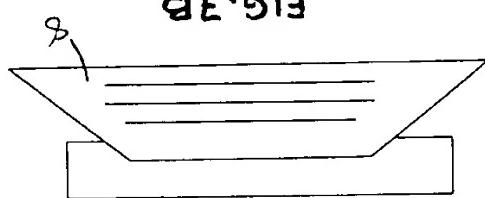
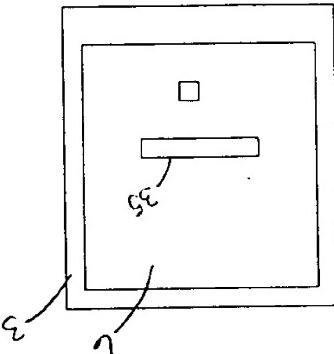
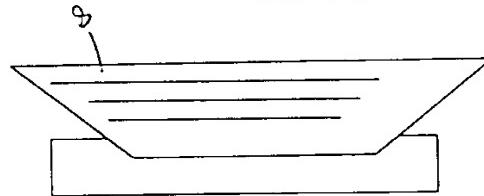


FIG. 7A



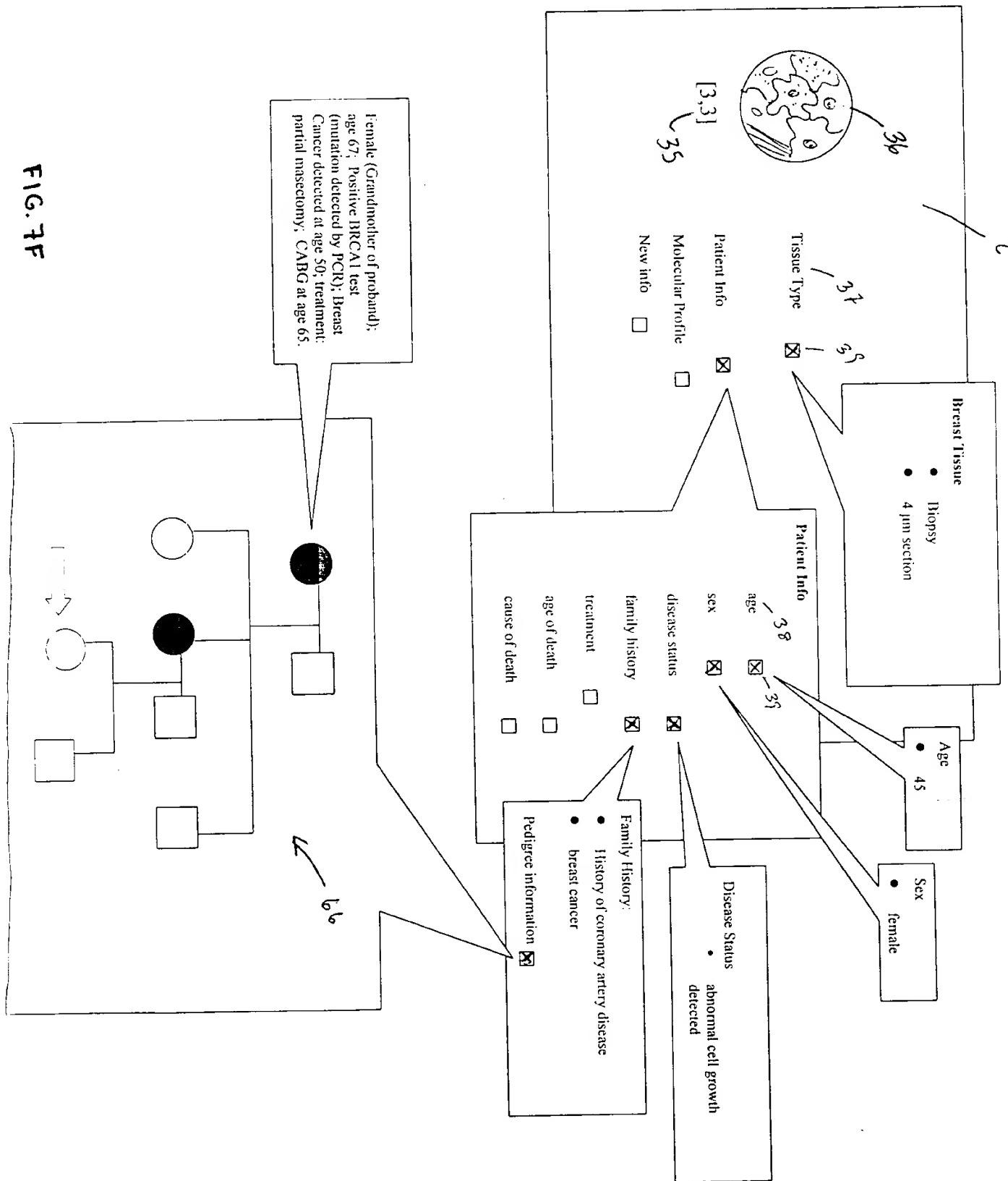


FIG. 7F

FIG. 3G

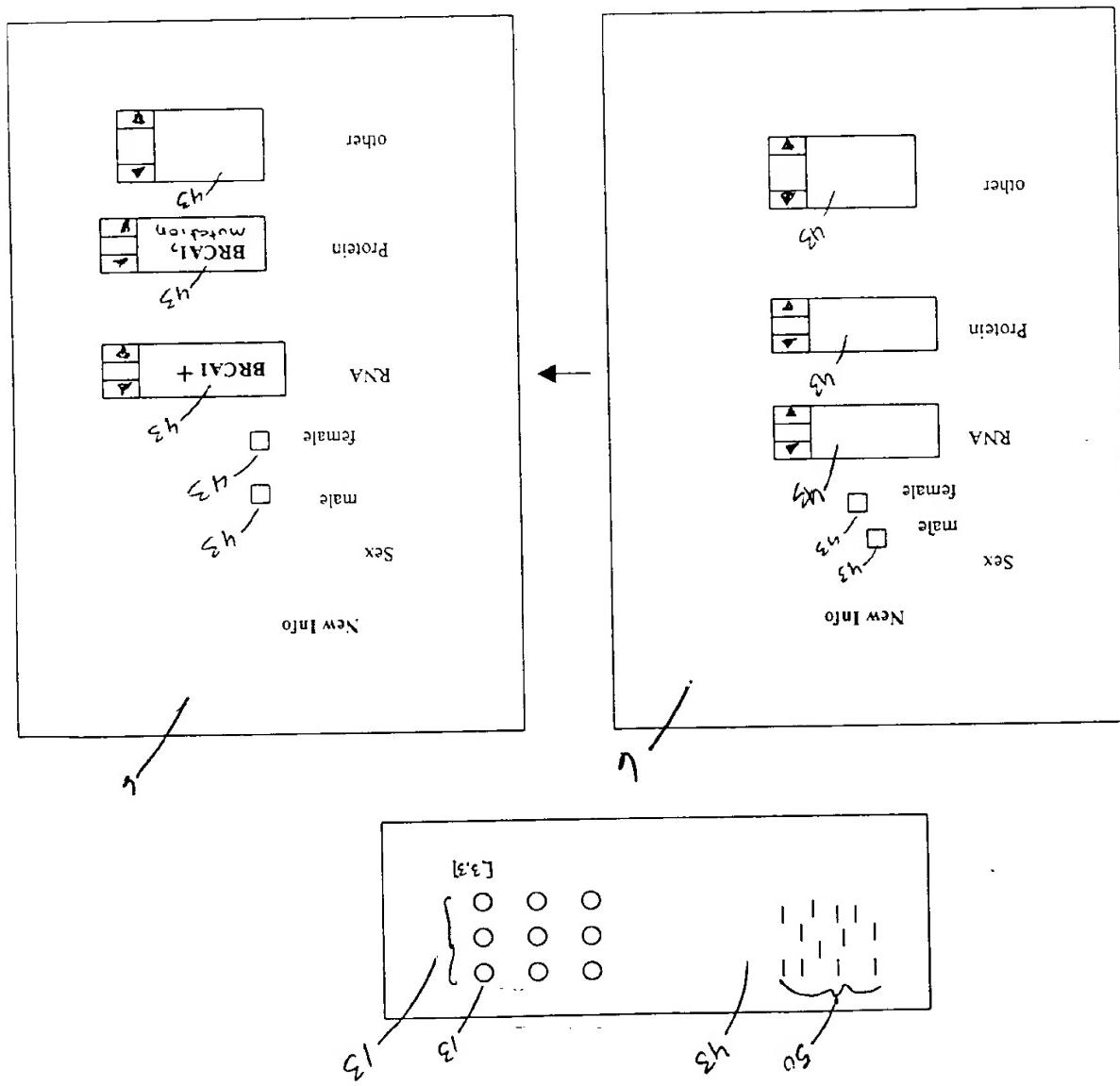


FIGURE 8

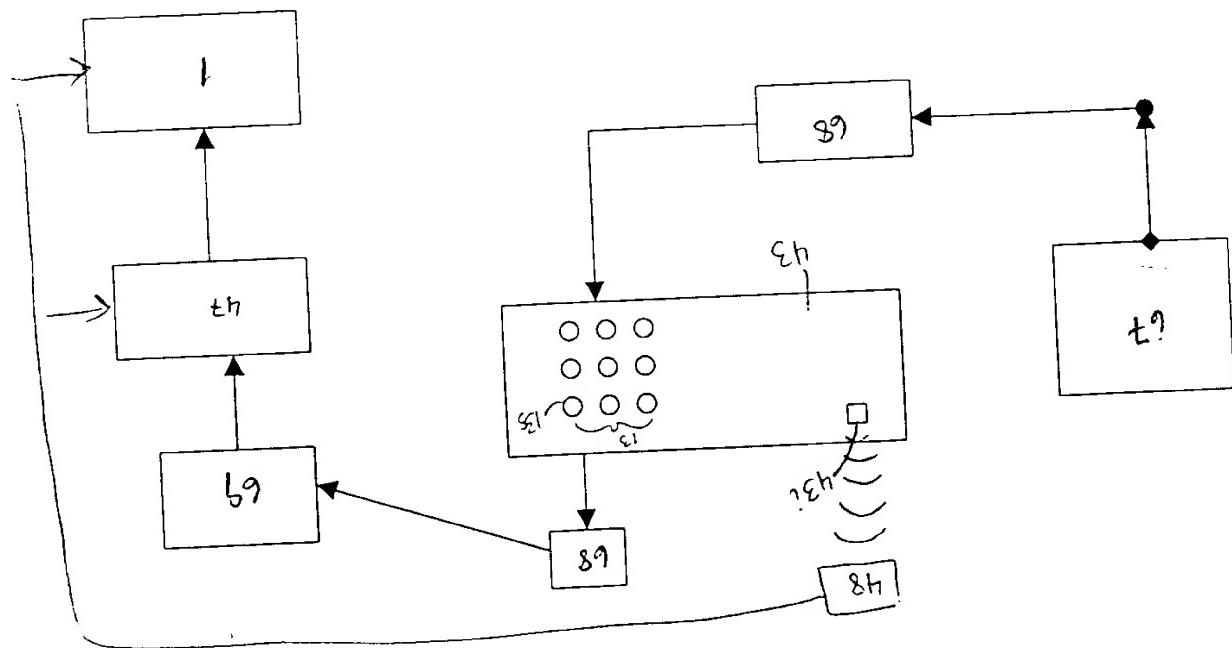
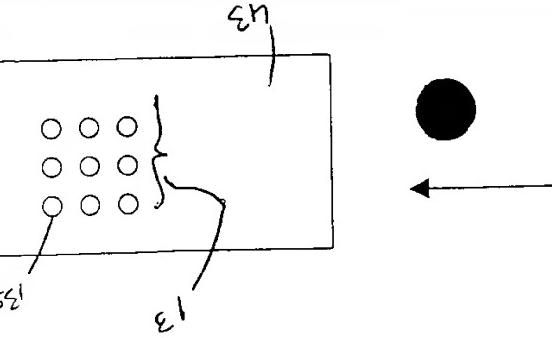


FIG. 9



**Order Form**

<input type="checkbox"/> normal	<input checked="" type="checkbox"/> Cerebellum	<input checked="" type="checkbox"/> medulla	<input checked="" type="checkbox"/> cortex	<input checked="" type="checkbox"/> Parkinson's disease	<input type="checkbox"/> Canavan's disease	<input type="checkbox"/> ALS	<input type="checkbox"/> Other parameters	<input type="checkbox"/> Submit
---------------------------------	--	---	--	---	--	------------------------------	---	---------------------------------

**Tissue Type**

16 brain  
17 lung  
18 heart  
19 liver  
20 spleen  
pancreas  
stomach  
colon  
kidney  
ureter  
urethra  
prostate  
ovaries  
testes  
eyes  
tongue  
trachea  
skin

**Billing Information**

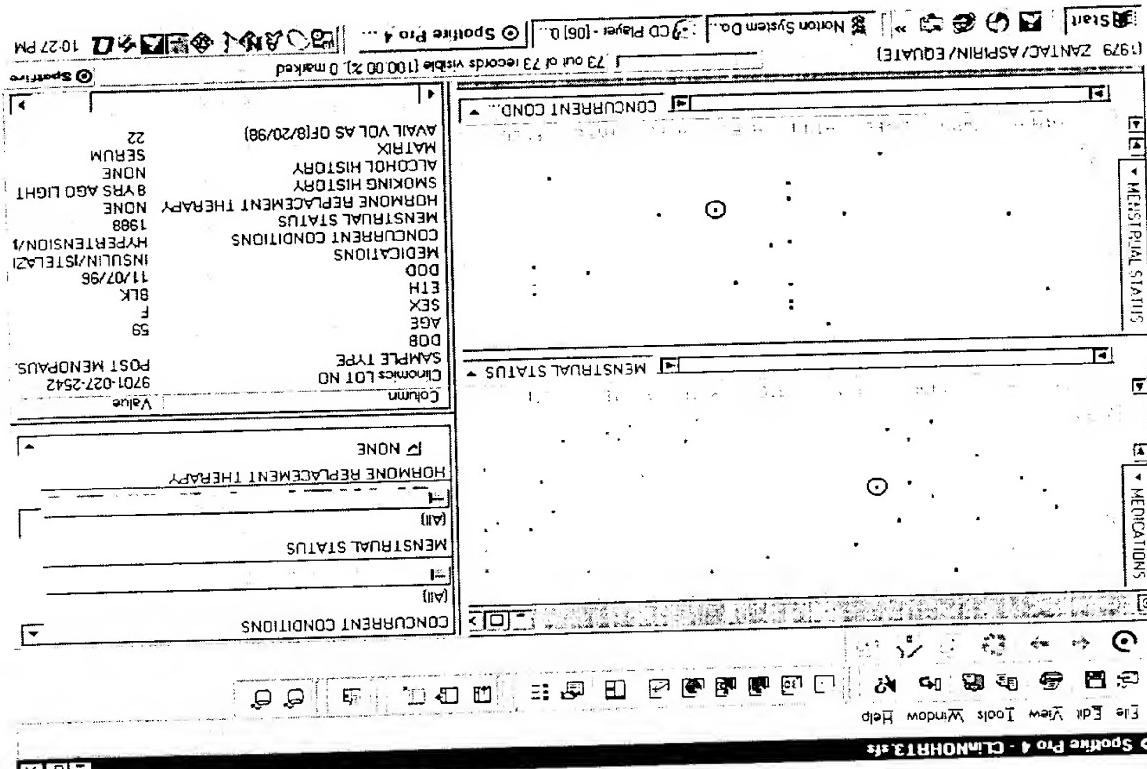
NAME <input>  
TITLE <input>  
COMPANY NAME <input>  
STREET ADDRESS <input>  
STATE OR PROVINCE <input>  
POSTAL CODE <input>  
Method of Payment <input>  
Account No. <input>  
Title of Microarray <input>  
Delivery Date: <input>  
Accept <input>

11

at

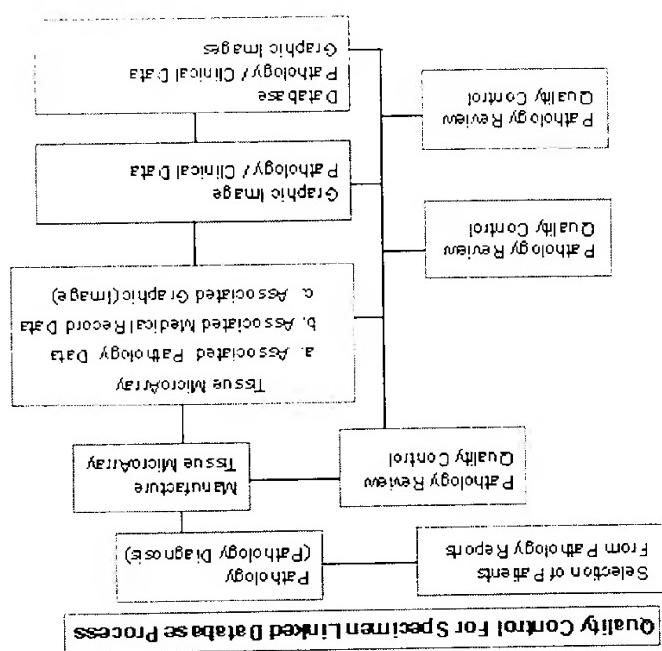
\

FIGURE 10



A. Faw Clinic History Data Retrieved from the Clinomics Biorepository Database.

FIGURE 12



SNO-MED ANATOME NUMBER

T.02 SKIN	T.41 ARTERY, GENERAL	T.77 PROSTATE	T.Y1 TRUNK, PERINEUM	T.03 SUBCUTANEOUS TISSUE	T.42 AORTA
MEDIASTINUM	RETROPERITONEUM	EPIDIDYMIS, VAS DEFERENS	T.Y4 ABDOMEN, PERITONEUM	THORACIC, DIAPHRAGM	T.04 BREAST
T.04 BREAST	T.43 CORONARY ARTERY	T.79 SCROTUM, SPERM CORD	T.Y3 THORACIC, VISCERA	T.78 TESTES, UTRICULA, VAGINALIS	T.02 SNO-MED ANATOME NUMBER
MEDIASTINUM	RETROPERITONEUM	PELVIS	T.Y6 PERITONEAL FLUID	VAGINA, HYMEN	T.07 SPLLEEN
T.08 LYMPH NODES	T.46 LYMPHOEDEMA, MESENTERIC ARTERY	T.82 UTERUS	T.2X LOWER RESPIRATORY	T.81 VAGINA, HYMEN	T.08 LYMPHATICS
UPPER RESPIRATORY	T.2X LOWER RESPIRATORY	T.83 CERVIX	T.83 GL FLD, SPACES	T.49 VEIN	T.11 BONE
T.09 LYMPHATICS	T.47 POPLITEAL ARTERY	T.84 ENDOMETRIUM	T.84 GI CONTENTS	T.49 VEIN	T.12 SYNOVIAL JOINT
GL FLD, SPACES	LYMPHOEDEMA, MESENTERIC ARTERY	T.85 MYOMETRIUM	T.7X URINE, TRA.FLD, SPACE	T.50 DIGESTIVE SYSTEM	T.13 MUSCLE
GI FLD, SPACES	POPLITEAL ARTERY	T.86 FALLOPIAN TUBE	T.86 MALE GENIT.FLD, SPACE	T.51 MOUTH, PALATE, ORAL	T.15 CARRILAGE
GI FLD, SPACES	POPLITEAL ARTERY	T.87 OVARY	T.87 PLACENTA, UMBCORD	T.52 LIP	T.16 BURSA
GI FLD, SPACES	POPLITEAL ARTERY	T.88 PLACENTA, UMBCORD	T.88 PLACENTA, UMBCORD	T.53 TONGUE	T.17 TENDON
GI FLD, SPACES	POPLITEAL ARTERY	T.89 FETUS	T.89 PLACENTA, UMBCORD	T.54 GUM, TOOTH, GINGIVA	T.18 SOFT TISSUE
GI FLD, SPACES	POPLITEAL ARTERY	T.90 ADRENAL	T.90 PLACENTA, UMBCORD	T.55 PAROTID, SALIV. GLAND	T.19 NOSE
GI FLD, SPACES	POPLITEAL ARTERY	T.91 PITUITARY	T.91 PLACENTA, UMBCORD	T.56 LIVER	T.21 NOSE
GI FLD, SPACES	POPLITEAL ARTERY	T.92 THYROID	T.92 THYMOUS	T.57 GALLBLADDER	T.22 SINUS, ACCESSORY
GI FLD, SPACES	POPLITEAL ARTERY	T.93 ADRENAL	T.93 THYMOUS	T.58 ECTRAHEPATICA, BILE DUCT	T.23 NASOPHARYNX
GI FLD, SPACES	POPLITEAL ARTERY	T.94 PITUITARY	T.94 ISLET OF LANGERHANS	T.59 PANCREAS	T.24 VOC, CRDL, LARY, EPICL
GI FLD, SPACES	POPLITEAL ARTERY	T.95 PLACENTA, UMBCORD	T.95 ISLET OF LANGERHANS	T.60 PHARYNX	T.25 TRACHEA
GI FLD, SPACES	POPLITEAL ARTERY	T.96 THYROID	T.96 THYMOUS	T.61 TONSIL, ADENOIDS	T.26 BRONCHIUS
GI FLD, SPACES	POPLITEAL ARTERY	T.97 PARATHYROID	T.97 THYMOUS	T.62 COLON, MESSENTERY	T.32 HEART
GI FLD, SPACES	POPLITEAL ARTERY	T.98 ESOPHAGUS	T.98 CONNECTIVE TISSUE	T.63 CMENITUM, STOMACH, PYLORUS	T.28 LUNG
GI FLD, SPACES	POPLITEAL ARTERY	T.99 FETUS	T.99 CONNECTIVE TISSUE	T.64 SM INTEST., DUODENUM	T.29 PLEURA
GI FLD, SPACES	POPLITEAL ARTERY	T.Y0 ADIPOSE TISSUE	T.Y0 CORPUS, CALLOSUM	T.65 JEJUNUM, ILEUM	T.30 CARDIO VAS SYST
GI FLD, SPACES	POPLITEAL ARTERY	T.Y1 TISSUE	T.Y1 BASAL, GANGLIA	T.66 APPENDIX	T.31 PERICARDIUM
GI FLD, SPACES	POPLITEAL ARTERY	T.Y2 TISSUE	T.Y2 THALAMUS	T.67 COLON, MESSENTERY	T.32 PULMONIC VALVE
GI FLD, SPACES	POPLITEAL ARTERY	T.Y3 TISSUE	T.Y3 KIDNEY	T.68 RECTUM	T.34 ENDOCARDIUM
GI FLD, SPACES	POPLITEAL ARTERY	T.Y4 TISSUE	T.Y4 PONS, MIDBRAIN	T.69 ANUS	T.35 CARDIAC VALVE
GI FLD, SPACES	POPLITEAL ARTERY	T.Y5 TISSUE	T.Y5 SPINAL CORD	T.70 PELVIC, COCCYX	T.36 TRICUSPID VALVE
GI FLD, SPACES	POPLITEAL ARTERY	T.Y6 TISSUE	T.Y6 CEREBELLUM	T.71 URETER	T.37 MITRAL VALVE
GI FLD, SPACES	POPLITEAL ARTERY	T.Y7 TISSUE	T.Y7 SPINAL CORD	T.72 PENAL, PELVIS	T.38 AORTIC VALVE
GI FLD, SPACES	POPLITEAL ARTERY	T.Y8 TISSUE	T.Y8 NERVE, VAGUS NERVE	T.73 URETHRA	T.39 AORTIC VALVE
GI FLD, SPACES	POPLITEAL ARTERY	T.Y9 TISSUE	T.Y9 SCAPL, ORBITAL	T.74 BLADDER	T.40 BLOOD VESSELS

## SNOMED DIAGNOSIS NUMBERS CARCINOM

FIGURE 14A

ADENOCARCINOMA	M 8143	ADENOCARCINOMA,ANAPLASTIC	ADENOCARCINOMA,CLEAR CELL
M 8233	M 8483	ADENOCARCINOMA,COLLOID	ADENOSQUAMOUS CARCINOMA
M 8313	M 8483	ADENOCARCINOMA,CYSTIC	ADENOCARCINOMA,IN-SITU
M 8263	M 8473	ADENOCARCINOMA,MUCINOUS CYST	ADENOCARCINOMA,MUCINOUS CYST
M 8263	M 8473	ADENOCARCINOMA,PAPILLARY	ADENOCARCINOMA,UNDIFFER.
M 8233	M 8493	ADENOCARCINOMA,UNDIFFER.	ADENOCARCINOMA,SIGNET RING
M 8630	M 8003	ANAPLASTIC CARCINOMA	ANAPLASTIC MALIGNANCY
M 9403	M 9433	ASTROCYTOMA,GRADE 1	ASTROCYTOMA,GRADE 2
M 8001	M 8253	ALVEOLAR CARCINOMA	ADAMANTINOMA
M 8553	M 9310	ACINAR TUMOR	ACINAR CARCINOMA
M 8093	M 8203	BASAL CELL CARCINOMA	BASAL CELL TRANSITIONAL CARCINOMA
M 8253	M 8090	BRONCHIOULAR CARCINOMA	BASAL CELL EPITHELIOMA
M 8123	M 8013	CARCINOMA,SMALL CELL	CARCINOMA
M 8053	M 8483	CARCINOMA,IN-SITU	CARCINOMA,COLLOID
M 8012	M 8043	CARCINOMA,PAPILLARY	CARCINOMA,UNDIFFERENTIATED
M 8983	M 8243	CARCINOID,TUMOR	CHOROIDCARCINOMA
M 8023	M 9103	CARCINOID,TUMOR	CHONDROSARCOMA
M 8023	M 8241	CARCINOID,TUMOR	CHONDRBLASTOMA
M 8163	M 9223	CARCINOID,TUMOR	CRANIOPHARYNGIOMA
M 8203	M 9230	CYLINDROMA	DYSPLASIA
M 8463	M 9230	CRYSTALINEFIBROSARCOMA	DUCTAL,INFILTRATING CARCINOMA
M 8453	M 9351	CYSTADENOCARCINOMA,PAPILLARY	EPENDYMOA
M 7600	M 9391	CYSTADENOCARCINOMA,PAULLEY	GYSTADENOCARCINOMA,PAULLEY
M 8503	M 9391	DERMATOFLBROSARCOMA	GYSTADENOCARCINOMA,PAULLEY

M.8073	EPIDERMOID CARCINOMA
M.8110	EPITHELIOMA
M.9263	EWINGS SARCOMA
M.8823	FIBROSARCOMA
M.8333	FOLLICULAR CARCINOMA
M.8803	GIANT CELL SARCOMA
M.8621	GIANT CELL TUMOR
M.9040	GLIOBLASTOMA, MULTIFORME
M.9443	GLIOMA
M.9383	HEMANGIOBLASTOMA
M.8033	HISTOCYTOMA
M.9161	HODGKINS SARCOMA
M.8830	HURTELL CELL CARCINOMA
M.8363	KAPOSI SARCOMA
M.9143	LEUKEMA, ACUTE MYELOGENOUS
M.9865	LEUKEMA, LYMPHOMA
M.9826	LYMPHOCTIC
M.9807	LYMPHOCTIC, CHRONIC
M.9893	LEIOMYOSARCOMA
M.9593	LYMPHOCTIC, LYMPHOMA
M.9623	LYMPHOSARCOMA, GIANT FOLLICULAR
M.9693	LYMPHOSARCOMA, LYMPHOCTIC
M.9643	LYMPHOMA, HISTOCYTIC
M.8083	LYMPHOMA, T-CELL
M.9703	LYMPHOCTIC, LYMPHOMA
M.8853	LIPOSARCOMA
M.9613	LYMPHOCTIC, LYMPHOSARCOMA
M.9530	MENINGIOMA
M.8016	METASTATIC CARCINOMA
M.8003	METASTATIC TUMOR
M.8006	METASTATIC, MALIGNANT TUMOR
M.9370	MEDULLOBLASTOMA
M.6972	MALIGNANT CELLS
M.8723	MALIGNANT MELANOMA
M.9473	MALIGNANT MESOTHYMOA
M.8243	MUCOEPIDERMOID CARCINOMA
M.8433	MALIGNANT CARCINOID TUMOR
M.8993	MALIGNANT MESOTHELIOMA
M.9051	MYELOMA
M.9733	METASTATIC MELANOMA

FIGURE 14B

M.8623	MALIGNANT GRANULOSA CELL TUMOR
M.8703	MALIGNANT PHEOCHROMOCYTOMA
M.9053	MALIGNANT MESOTHELIOMA
M.8893	METASTATIC LEIOMYOSARCOMA
M.8953	MESODERMAL TUMOR
M.8940	NEURROBLASTOMA, NEUROEPITHELIOMA
M.9503	NECROTIC TUMOR
M.5443	NEURROBLASTOMA, NEUROEPITHELIOMA
M.9453	OLIGODENDROGLIOMA
M.8043	OAT CELL CARCINOMA
M.9200	OSTEOBLASTOMA
M.9180	OSTEOMA
M.9183	OSTEOSARCOMA
M.9190	OSTEOCHONDROMA
M.9210	PAPILLARY CARCINOMA
M.9733	PLASMA CELL MYELOMA
M.8463	PAPILLARY METASTATIC CYTADENOCARCINOMA
M.8133	PAPILLARY TRANSITIONAL CELL CARCINOMA
M.2485	RENAL CELL CARCINOMA
M.9643	RETICULUM CELL SARCOMA
M.8313	RENAL CLEAR CELL CARCINOMA
M.8073	SQUAMOUS CELL CARCINOMA
M.8316	SARCOMA, RETICULAR CELL
M.8070	SQUAMOUS EPITHELIAL TUMOR
M.8072	SQUAMOUS CELLS CARCINOMA IN-SITU
M.8803	SARCOMA, UNDIFFERENTIATED GIANT CELL
M.9643	SPINDLE CELL CARCINOMA
M.8033	SEMINOMA
M.9063	STROMAL SARCOMA
M.8933	TUMOR
M.8001	TUMORLET
M.8043	THYMOA MALIGNANT
M.8583	TRANSITIONAL CELL CARCINOMA
M.8123	TERATOMA
M.9081	VERRICULOUS SQUAMOUS CARCINOMA

FIGURE 14C

BRAIN INVENTORY CLASSIFICATIONS

FIGURE 15